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NURSING EDUCATION THROUGH MULTI-SENSORY APPROACHES, REPORT OF A WORKSHOP (DELTA COLLEGE, UNIVERSITY CENTER, MICHIGAN, DECEMBER 8, 1966).

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THIS 1966 WORKSHOP DEALT WITH THE PREPARATION OF AUTO-TUTORIAL LABORATORY TECHNIQUES FOR NURSING TRAINING FOR GRADUATES, STUDENTS, AIDES, AND PATIENTS. TAPE RECORDERS, FORMS, TRANSPARENCIES, AND OTHER AUDIO-VISUAL AIDS BRING DISCUSSION, DEMONSTRATION, AND PRACTICE INTO CLOSE SEQUENCE. THEY ARE USEFUL (1) IN THE PRESENTATION OF MANY NURSING PROCEDURES (CARE OF CASTS, TRACTION, GOWNING, BED-MAKING, ETC.), (2) IN PRECONDITIONING THE STUDENT TO TRAUMATIC SIGHTS (EPILEPTIC SEIZURE, MAJOR SURGERY, AUTOPSY), (3) IN CLARIFICATION OR ADDED COMPREHENSION OF LECTURE MATERIALS, (4) IN PRESENTING INTERVIEW TECHNIQUES, (5) IN PROVIDING IMMEDIATE FEEDBACK AND THEREBY STRENGTHENING STUDENT-INSTRUCTOR RELATIONSHIPS, AND (6) IN ALLOWING MORE EFFECTIVE USE OF THE FACULTY IN TEACHING INCREASING NUMBERS OF STUDENTS. THE STUDENT SETS HIS OWN PACE AND, WITHIN REASON, MAY TAKE HIS TEST WHEN READY. THIS HAS SEVERAL POSITIVE RESULTS--(1) HIS MOTIVATION IS MAINTAINED, (2) HE GAINS SATISFACTION BY SHOWING THAT HE IS SURE OF HIS KNOWLEDGE, (3) HE IS NOT FRUSTRATED BY WORKING BESIDE SLOWER OR FASTER LEARNERS, (4) HE CAN USE THE INSTRUCTOR'S TIME MORE FLEXIBLY, AND (5) HE FINDS NO FLUCTUATION IN THE QUALITY OF HIS INSTRUCTION. (HH)

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Nursing Education through Multi-Sensory Approaches

UNIVERSITY OF CALIF.
LOS ANGELES

NOV 3 1967

CLEARINGHOUSE FOR
JUNIOR COLLEGE
INFORMATION

AUDIO TAPE RECORDINGS

COLORED SLIDES

FILM STRIPS

MANIPULATION OF MATERIALS

MOVIES:
8mm & 16mm

NURSING CARE EQUIPMENT

STUDY GUIDES

JC 670 911

REPORT OF WORKSHOP

Nursing Education Through Multi-Sensory Approaches

December 8, 1966

Delta College

University Center, Michigan

Supported by:

Project Grant for Improvement in Nurse Training

United States Public Health Service

Under the Nurse Training Act of 1964

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June, 1967

Note from Crystal M. Lange

Since the writing of this report, Delta College Nursing faculty have produced the following films. They have been filmed in 16mm color which is now in the process of editing for duplication and cartridging in super 8mm for use in the Technicolor Super 8mm projector. Copies of these materials will be available for purchase at the cost of duplication (which is yet to be determined - probably around $15 each).

1. Restraints
2. Insertion of a Rectal Tube
3. Suppositories: Rectal
4. Suppositories: Vaginal
5. "Ready to Use" Enema
6. Application of Heat to the Perineum (Light)
7. Application of Heat to the Perineum (Compresses)
8. Female Perineal Care (Clean Technique)
9. Male Perineal Care
10. Female Pelvic Examination
11. Peri-Pad Placement
12. Vaginal Irrigation
13. Handwashing Routine
14. Oral Medications: Setting Up
15. Simple Dressing Change
16. Fetal Heart Tones
17. Preparation and Use of Trilene Mask
18. Sterile Gowning; Assisting
19. Scrub Without Brush (Nursery, Labor Section)
20. Nursery Scrub With Brush
21. Sterile Gloves: Putting On
22. Bandaging: Elastic
23. Applying a Sling: Hammock Type
24. Applying a Sling: Triangular Bandage
25. Draping: Genupectoral Position (Knee-Chest)
26. Draping: Lateral Position (Sims)
27. Draping: Dorsal Recumbant Position
28. Draping: Horizontal Recumbant Position
29. Bed making: Mitered Corner
30. Scultetus Binder Application
31. Fundamentals: Back Care
32. Fetal Monitoring
33. Induction of Labor
34. Gross Placental Physiology
35. Obstetrical Forceps
36. Timing Contractions
37. Foley Catheter Removal
38. Throat Irrigation
39. Ice Collar Application
40. Filling an Ice Bag
41. Filling a Hot Water Bottle
42. Levine Irrigation
43. Bed Shampoo
44. Simple Compresses

INTRODUCTION

The workshop, "Nursing Education through Multi-Sensory Approaches," is the result of intensive deliberations and preparations on how to best utilize the competencies of various educators throughout the country knowledgeable in the use of audio-visual materials. They were asked to participate in the development of materials to be used in the project.

Grateful appreciation is acknowledged to the many who helped plan the workshop. Special acknowledgements are hereby expressed to two educators who gave invaluable assistance in the development of materials — Dr. Samuel N. Postlethwait, who delivered the keynote address, and Mrs. Crystal M. Lange, who worked diligently in developing materials and shared her unique experiences in the use of multi-media approaches in teaching nursing techniques.

It has been stated many times that nursing educators urgently need to prepare greater numbers of students with approximately the same numbers of educational staff in order to meet the health care needs of society. To further compound this problem is the dearth of qualified nursing supervisory personnel to staff the health agencies in the community. Finally, an increasing student population is entering the nursing curriculum with a diversity of experiences, thereby making it necessary to utilize various approaches in the teaching process.

With these objectives the pre-project workshop was developed and implemented. The synthesis is hereby presented.

Luis E. Folgueras
Project Director

Description of Pre-Project Workshop

The Workshop had as its purpose:

To assist Delta College faculty in the overall planning of materials to be developed for use in the auto-tutorial and mobile-tutorial laboratories.

Objectives:

1. To demonstrate the multi-sensory approach as it is presently used by Dr. Samuel N. Postlethwaite.
2. To enable the workshop participants to participate in a multi-sensory learning experience.
3. To demonstrate the materials developed to date at Delta College.
4. To identify materials presently being developed or planned by other nursing educators throughout the country.
5. To elicit reactions, ideas, and suggestions from the workshop participants in order to plan and produce effective materials at Delta College.

The activities planned to meet the objectives included the following:

1. An in-person presentation by Dr. Samuel Postlethwaite which verbally and visually, by means of a film, described the multi-sensory approach as it is being used to teach botany to freshman students at Purdue University.
2. All workshop participants were given materials and instructions for a multi-sensory learning experience.

3. Single concept films were shown which demonstrated the types of materials developed to date at Delta College.
4. Small group discussions and demonstrations identified materials being developed in other nursing programs.
5. Participants submitted ideas in writing during a planned writing session.
6. A large group question and answer period at the end of the workshop elicited multiple reactions from the participants.

Highlights From The Workshop

Dr. Samuel N. Postlethwait presented the keynote address in which he discussed the historical development of the audio-tutorial system; showed a film of the system in action; and summarized the educational concepts which have emerged from the use of the audio-tutorial approach.

Each of the workshop participants was given a tangelo, a knife, a paper towel, an aluminum foil wrapped towelette, and a paper bag. By means of a pre-prepared audio tape they were given directions to identify specific parts of the tangelo, cut it in a prescribed manner, and taste the fruit. While the participants were performing the activities as directed, they were given information about the tangelo and its development. The general reaction of the workshop participants to the sample multi-sensory learning experience was enthusiastic and provided a base for further suggestions in the use of multi-sensory learning experiences. The participants were able to experience the tangelo by means of listening, seeing, smelling, feeling, and tasting.

Afternoon discussion groups considered several aspects of the auto-tutorial approach to the teaching of nursing. Following the group discussion, each participant was asked to submit ideas in writing. The discussion sessions were tape recorded and revealed some general agreement that the auto-tutorial techniques do offer many possibilities in the teaching of nursing at all levels including graduate nurses, students, nurse aides, and patients. Each group considered the problem of identifying specific objectives prior to the development of any materials.

Total faculty commitment to the auto-tutorial approach appears desirable although not necessarily essential depending on the relative numbers of faculty. One workshop participant is a member of a large faculty group in a university and has

been producing auto-tutorial materials for use in a first level nursing course. The faculty members who ordinarily teach in the first level course are involved in the planning and production of materials as well as the implementation with students. Faculty members in the advanced nursing courses are aware that new approaches are being utilized, but they are not directly involved or committed to the use of auto-tutorial materials. On the other hand a small faculty group who must share teaching responsibilities would of necessity need to work closely together in the planning, production and implementation of auto-tutorial materials. The more complete the faculty commitment to the auto-tutorial approach the more effective and efficient should be the produced materials for student learning.

Types of learning experiences which lend themselves to the auto-tutorial approach include motor skills (such as catheterization, hand washing, and irrigations) and perhaps inter-personal relationship skills. The concepts of basic communication were discussed with the view that learning experiences provided in the auto-tutorial laboratory could possibly enable students to learn these skills.

The use of a portable tape recorder was suggested to record student-patient inter-action for the purpose of student self-evaluation. At pre-arranged times, a tape recorder could be used to record what a student says to a patient and how the patient responds. Such recordings might be made at the beginning and end (or at regular intervals) of each nursing course for the purpose of studying, evaluating and improving nurse-patient inter-action. When a student is to explain a procedure to a patient; such as an enema, a tape recording would enable both student and instructor to evaluate the performance outside of the patient care area. Comparison of earlier taped interactions would enable student and faculty to determine individual student progress. Selected tape recordings might provide excellent auto-tutorial study materials (permission for such use being granted by the patient and student).

Possibly prescribed nurse-patient inter-actions could be planned and tape recorded for student study.

The advantage of students becoming self directed in the auto-tutorial situation was related to nurse functions. It is necessary to identify what skills the student has when he begins a course of study and what skills he is to have when he completes the course. It may be possible to influence characteristics of students in addition to knowledge and skills, namely attitudes toward and about nursing care.

Auto-tutorial materials would permit students to prepare for experiences which are usually difficult to observe due to individual student emotional involvement. The experience of observing a delivery, an operation, severe burns, epileptic seizure, or autopsy might be less traumatic to the student. An opportunity to view a specific situation in the auto-tutorial laboratory (such as the severe burn) would enable the student to handle his own emotional responses to some degree prior to the actual experience with a patient. The student would be more able to observe exactly what was happening with a patient if he knew what to anticipate and he was not immobilized by his own emotional response to the patient.

Materials could be used in the auto-tutorial setting to test or evaluate student skills as well as to teach. An actual patient situation could be shown to the student on film and then direct the student to react to the situation in specific terms such as evaluating patient position or nurse body mechanics, or identify patient needs.

Of the workshop attendants, seventeen submitted ideas which have been arbitrarily classified in three categories: (1) specific suggestions, (2) ideas and impressions, and (3) questions or problems. A summarization of ideas in each of these three areas is included in this report.

Three of the workshop participants, Miss Chandliss, Mrs. Burns, and Miss Piekarski, remained for a follow-up conference the following day. Ideas, experiences and materials

were shared and discussed. The group identified a major need for a conference bringing together all persons involved in projects in the audio-visual area. A telephone call was placed to Miss Constance Holleran, Chief Nurse Consultant Project Grant Section, and followed up with a telegram signed by each of the discussants. Miss Jessie M. Scott, Chief, Division of Nursing, Department of Health, Education, and Welfare replied to the telegram. A copy of the response to Miss Scott's letter is included in the appendix along with a copy of the telegram and Miss Scott's response.

As a result of the pre-project workshop, Delta College faculty and staff were able to learn more about auto-tutorial techniques as presented by Dr. Postlethwait. Many valuable ideas, suggestions, and information were submitted by the workshop participants which will be utilized in the implementation of the project. The inclusion of students currently enrolled in the nursing curriculum as participants in the workshop provided a direct avenue of communication to students and reactions from students. The contributions of the students will be invaluable in the project implementation designed to enable students to learn by means of multi-sensory materials.

Ideas and Impressions

There were varied reactions to the production and utilization of multi-sensory materials. Some of the participants expressed concern regarding the potential utilization of visual materials by stating that films should not replace lectures. Others stated the act of seeing and doing should make an effective impression on the student.

Several of the participants expressed the opinion that the less time lapse between lecture, laboratory, and hospital experience, the total learning would be much more effective. To this point, they felt the availability of visual materials in the clinical setting should assist in reinforcing student learning.

Several of the participants were concerned regarding the technical aspect of production of multi-sensory materials. They felt that by the use of professional technicians many errors in production could be avoided. Another point emphasized was that a voice familiar to the student listeners would be preferable to an unfamiliar voice as usually found in professional productions. Their feeling was that primarily because of identification, the use of the particular institution's faculty would be preferable. Several commented that another potential use of auto-tutorial techniques would be in evaluating student progress.

Many of the reactors felt that auto-tutorial education techniques might be valuable for hospital inservice education and for the inactive nurses who might not be able to attend daily classes. The difficulty in developing an auto-tutorial laboratory in institutions with limited numbers of students and budget was expressed by several members of the group. In order to overcome this type of situation, it was suggested that a central resource person could assist the institution in the preparation of auto-tutorial materials to conserve time, energy, and funds.

There was general agreement that planning for the learning experiences must begin with clearly defined objectives. The identification of entry and exit behaviors would provide a frame of reference for the development of learning activities. In addition, being aware of the student's background, experiences, prejudices, and interests, would enhance the development of learning materials. Keeping these factors in mind would assist in the development of the materials, logical progression and sequence.

Specific Suggestions

The greater number of suggestions were primarily concerned with the possible use of single concept films and auto-tutorial approaches. Some of the suggested subjects included:

1. A growth and development series, from birth to old age.
2. Patient teaching and preparation for surgeries and self-care techniques.
3. Nurse-patient interviewing techniques.
4. Body mechanics for the nurse in moving, lifting, and positioning.
5. Meeting specific nursing care needs of patients.

It was suggested that the multi-sensory approach might enable the student to deal with her personal, emotional responses to traumatic experiences prior to the actual exposure in the clinical laboratory setting. Some suggested experiences to be developed on single concept films might be, an epileptic seizure, major surgery, or an autopsy. Other suggestions included specific procedural techniques such as: care of orthopedic casts, traction care, elimination, hand washing, gowning, gloving, catheterization, changing of surgical dressings, bed making, levine tubes, types and colors of drainage and use of specific equipments. In addition, the developed materials could be used as part of student evaluation.

The participants discussed the feasibility of utilizing upper classmen or senior students as assistants in the auto-tutorial laboratory. This would reinforce the upper classmen's learning when they participate in assisting beginning students with the fundamental nursing procedures. This also would help the upper classmen develop a concept of the dynamics of instructional teaching.

Workshop participants also expressed agreement that small group sessions are essential to student learning and provide opportunities for individual student participation. This, in turn, helps faculty members to gain insight and feedback from students while strengthening the instructor-student relationship. This "feedback"

would also enable faculty to continually revise and improve the total learning experiences.

Questions and Problems

Workshop participants identified some of the problems relative to the implementation of the auto-tutorial laboratory. It was general consensus that orientation to the use of the auto-tutorial laboratory will need to be planned for both students and faculty. The staffing of the laboratory will need to be resolved. For example: Will it be teaching assistants or prepared instructors? Provision for rapid progression need to be considered in relation to how quickly a student should be permitted to complete a sequence of learning experiences. Another question posed was if a plan for distribution of materials to other institutions had been developed. Other participants asked what were the advantages of new audio-visual methods as compared to the traditional method of teaching in relation to time, reactions of students, and retention of learning?

Summary and Conclusions

The workshop enabled Delta College faculty and the workshop participants to identify ways in which the multi-sensory approach may be utilized in nursing education. Dr. Postlethwait described activities at Purdue University. Mrs. Lange provided a multi-sensory experience for the workshop participants and demonstrated some of the materials developed at Delta College. Small groups met to share ideas, experiences and materials followed by an "idea writing" session.

The multi-sensory approach holds much potential for improvement in nursing education and some problems. Discussion, demonstration, and practice can be brought into close sequence. Many skills may be taught by means of the auto-tutorial laboratory including motor skills, interviewing techniques, observation skills and inter-personal relations. There is agreement that objectives need to be defined, entry and exit behaviors identified, and technical assistance made available when developing auto-tutorial materials. There are problems relating to student and faculty orientation to auto-tutorial concepts, staffing the auto-tutorial laboratory, cost, and distribution of materials to nursing education programs. Comparative studies of the auto-tutorial approach to traditional methods would be helpful.

AN AUDIO-TUTORIAL APPROACH TO TEACHING BOTANY

S.N. Postlethwait

Purdue University

I would like to divide my talk into four parts: First, I will discuss the history of the audio-tutorial system; second, I will show you a film of scenes from our learning center; third, I will discuss the audio-tutorial system as we currently operate and some of the results; and fourth, I wish to summarize with some of the educational concepts which have emerged as a result of our experience.

1. The audio-tutorial system began approximately five years ago as an attempt to make some adjustment for the diversity of backgrounds of students in a freshman botany course. The course involved 380 students and was a four hour credit course. It mainly served freshman students in the Schools of Pharmacy and Agriculture. These students have attended a great variety of kinds of high schools so that some had received very excellent training and others relatively poor training. Students with equal capacities could not perform equally well because of this difference in background. To assist the students with poor background, it was decided to make a special lecture on tape each week and file this tape with the language tapes in the Audio-Visual Library. Students who wanted could go to this facility and hear the supplementary lectures and thus enable them to compete more effectively. During the course of preparation of these lectures, it occurred to me that the student might well bring their text book along and open it to the appropriate pages so that the subject matter in the text could be related to the subject matter covered by the tape lecture. Later it seemed logical to add the use of their laboratory manual in the same pattern so that the subject matter in the laboratory manual could be related to the subject matter in the text and to the subject matter on tape. Still later, it seemed feasible to provide the student

with plants and experimental materials so that these too could be related to the laboratory manual, text book and tape lecture. Ultimately the discussion on the tape was no longer a lecture but rather was a discussion on a one-to-one basis, one teacher-one student, in which I was tutoring the student through a sequence of learning events. The tape was prepared by arranging the various items which I felt would contribute to the student's learning on a table before me and talking into the tape player as if I were visiting with a friend helping him study. Learning events included a great range of experiences such as reading from the text, doing an experiment, collecting data, analyzing data, manipulation of a microscope, watching a time lapse movie, observing plant specimens, charts, diagrams, photographs, and listening to brief lectures or discussions as appropriate. The success of the initial tapes encouraged me to run an experiment of 36 students for one semester which further confirmed the potential of the audio-tutorial system. At the end of the second semester of experimentation, I met with these students to restructure the botany course, disregarding all traditional limitations and placing total emphasis on student learning. All busy work would be eliminated and an attempt would be made to adapt the method of presentation to the nature of the objective. The first restructed course included the following study sessions.

One hour per week--General Assembly Session (GAS); 1 hour per week--Small Assembly Session (SAS); and ? hours per week--Independent Study Session. The Independent Study Session was the modification of the original audio taped tutorial. The ingredients of the course perhaps will be best communicated to you through the use of a movie film showing scenes from our classroom. This film follows the activities of a student through one week's work. I would emphasize at this point that several changes have been made since the film was produced. These changes were based on our experience and constant brainstorming with teaching assistants and students; however, the basic outline provides a good background for the

remainder of my discussion. At one point in the film where the student is asked to use a 8mm Technicolor projector, there will be spliced in some work prints of the kinds of learning events we would expect to be presented through the single loop film medium. I will show you the film now and discuss some changes we have made immediately after the viewing. Let us now go to the film.

2. SHOW FILM--"A Multi-faceted Approach to Teaching Botany"

3. I am stopping the film before it discusses the Small Assembly Session because we have made several changes in this session, and I don't want to take up time with the outdated information. Two Sessions we have already discussed--the Independent Study Session which remains the same except for some minor changes such as the increased use of 8mm film and improved arrangements of furniture in the learning center and the General Assembly Session which was discussed on film remains essentially the same.

An Integrated Quiz Session (IQS) has been substituted for the Small Assembly Session. The IQS is a modified seminar and oral quiz. It involves eight students seated informally around a table with one instructor. The instructor is supplied with the various items which were included in the learning center the preceding week, and these items are used as a basis for student discussion. All students are asked to discuss items in their turn and are asked to do so in a specified pattern or format. First, the item is to be identified; secondly, the student is to tell its role in the week's work or objectives; and thirdly, the student is to explain how it fulfills this role. These items include a great variety of materials such as plant specimens, a microscope, 2 X 2 slides, diagram or chart, a time lapse movie, all or parts of experimental equipment, or any other materials which have been used as a subject of study during the proceeding week. The student's performance is evaluated immediately on the basis of 0-10 points. If the instructor is much impressed, the

student is placed in the category of excellent and receives a score of 9. If the instructor is not impressed, the student is placed in the category of mediocre and receives a score of 7. If the instructor is depressed, the student is placed in the category of poor and receives a score of 5 or less. Six is a passing score, and all scores are subject to change as the discussion continues. Each student has an opportunity to add comments concerning any item which he thinks may enlighten the group. The instructor will then raise his score as seems to be appropriate. The items are distributed to the students in a sequenced fashion so that the theme or themes of the week are clarified and where experiments lead progressively from experiment "A" to experiment "B" to experiment "C", etc., this progressive relationship is retained during the session. This session has been an effective feedback mechanism for informing us of the success or failure of any program sequences of experiments and often provides clues for improving our approach. It also helps to clarify the appropriateness of the communication vehicle used in attempting to achieve the objective. It turns into a miniaturized seminar and thus enables many students to see relationships and concepts which were not evident from the Independent Study Session earlier. The IQS is also an effective tool for preventing procrastination on the part of the students.

Two questions most commonly asked concerning the system are as follows:

1. Have we not now eliminated the personal contact important for motivation?
2. Is this not now a "spoon-fed" type operation in which there's not opportunity for student discovery or inquiry? In answer to the first question concerning personal contact, is that we find personal contact is actually enhanced. We now have relegated much of the routine of teaching to a routine vehicle and teacher's time now can be devoted to meaningful personal contact. The opportunities for personal contact are as follows:

1. As in the conventional lecture system, the senior instructor is available

at the General Assembly Session for this kind of personal contact such as it is.

2. In the Independent Study Session an instructor is available to give direct attention to individual needs on a one-to-one basis for any problem requiring instructor assistance. Also in this session students may visit with instructors about any additional aspects of the subject matter which they find interesting.
3. The IQS provides an opportunity for every student to become well known by at least one instructor in the course, and every student to know at least one instructor very well. Additional opportunity is available for every student to know many instructors well but there is no alternative but to become well acquainted with at least one instructor.

The second question concerning inquiry is also answered in the affirmative. First, may I define levels of inquiry. Inquiry occurs at various levels with the maximum or first level of inquiry represented by research. The second level of inquiry is the type of experimentation which can be completed in the span of a three-hour laboratory. The third level of inquiry is one in which the busy work of doing the experimentation is completed by the instructor and the student is asked to collect data from the results and analyze these data. The fourth level of inquiry is to provide the student with data and ask the student to analyze these data. The fifth, of course, would not be considered real inquiry but merely a demonstration. All of these levels of inquiry are feasible under the audio-tutorial system. At the first level of inquiry, our students are asked to do two miniature research projects, the first of which we provide guidance throughout the project and the second is left totally to the initiative of the student. In the first project the problem is defined,

the materials and methods are described, the student is told what data to collect and asked to analyze these data and write up the project in the format of a scientific paper. The second project is completed by those students who hope to make an "A" in the course and here the student is restricted only by the materials available to him. He defines the problem, decides on the experimental procedure, what data to collect, analyzes these data, and writes up his project in the form of a scientific paper. At the second level of inquiry, a problem is defined for an experiment requiring two to four hours and is done in the ISS as well under the audio-tutorial system as under the conventional system. The subsequent levels of inquiry are also handled effectively in the ISS. The results of the A T system have been positive from every point of view. Better instruction can be given with equal or less staff and space. Grades and student interest have improved at all levels. Costs are reduced for equivalent levels of instruction.

4. Now may I take a few moments to discuss the philosophy of the audio-tutorial system as I see it in retrospect after five years of experience. It is sometimes said that "teaching is an art". This may be true however, "education" should be a "science". The scientific method demands that one begin by defining the problem first. The "problem" in education, simply stated, is "learning must be done by the learner". While this is not a very profound observation, it stands to reason that if "learning is done by the learner", the educational system should provide activities which require student involvement. Both teacher and student alike should be concerned with the kinds of activities and situations which contribute to learning. If these activities and situations can be identified, the teacher is obligated to provide a course structure which will permit the

the student to engage in these activities and the student is obligated to perform them conscientiously. I would like to list some of these activities and situations as I see them.

1. Repetition.--There is little question but that the nature of many objectives require repetition for their achievement. However repetition ought to be engaged in an intelligent fashion and adapted to the individual needs of a particular student. For example, a student who has learned about the Krebs cycle in high school biology has little need for extensive repetition of this study in a college biology course. On the other hand, a student who is encountering the Krebs cycle in his college biology course for the first time may find it necessary to repeat this study or certain portions of it, a great many times. In a course with 500 students the teacher cannot possibly make the adjustments in repetition for individual student needs. Only the student can determine intelligently how much repetition is necessary.

2. Concentration.--Most classrooms are not organized to permit students to concentrate during their study. Students are distracting to one another and other disassociated events which may be occurring tend to divert the student's attention from the subject at hand. The audio-tutorial system permits the student to isolate himself from the surrounding environment through the covering of his ears with the earphones and the use of booths to reduce his awareness of his surroundings.

3. Association.--In a study of plant science the major objective is to learn about plants. It makes sense therefore, that a study of plants should be conducted where plants are available for observation. Diagrams, charts, models, photographs, and other such devices should be a "means to the end" that students' attention is directed to the literal plant itself. The audio-tutorial system provides an opportunity for the student to have a plant available at the time he reads about it, does experiments, etc.

4. Appropriate sized units of subject matter.--People vary considerably in the amount of subject matter that can be grasped in a given amount of time. Programmers have demonstrated that most people can learn almost anything if it is broken into small enough units and the student can take time to become informed about each unit before proceeding to the next. Any program of study therefore should provide each student an opportunity to adjust the size of the unit to his own ability to assimilate the information so that those who can absorb large quantities of information may do so in an unrestricted fashion whereas others who must proceed more slowly, the course structure should permit them this opportunity to do so. The audio-tutorial system allows the student to proceed at his own pace and to break the subject matter into units commensurate with his ability. This is especially important where the learning events are sequences with subsequent events dependent on a mastery of proceeding ones. The human mind with its limited attention span frequently is distracted during the presentation. If this distraction

coincides with a point which is particularly critical to subsequent units of information, when the subsequent units are presented the student's deficiency may frustrate the learning experience. Presentation of material over a long span of time may result in progressively increased frustration such that the student assumes the attitude that the subject matter is too difficult for him. In order to maintain status with his peers, he may develop an attitude of "I don't want to learn this material" simply as a defense mechanism. Experiences such as this throughout several years of exposure to formal education may cause many educatable people to develop mental blocks which are difficult to overcome. The same information presented to the same student in a setting where the student can make each foundation idea firm before proceeding to the next can result in successful learning. "Success begets success" and successful experiences will tend to encourage the student to greater achievement. The educator could well afford to learn from a successful construction engineer who pours a concrete foundation carefully shaped and positioned to support the future structure and then permits this foundation adequate time to become fixed or firmed before placing on it the subsequent materials. Bricks and mortar are laid alternately with each brick and measure of mortar carefully placed to provide a bed for the positioning of the next bricks to be laid. Only in education do we pour forth the units of subject matter along with the cementing materials at a fixed rate, mixing together the bricks and mortars without regard to the many other factors

which may affect the resultant organization.

5. Adapt the nature of the communication vehicle to the nature of the objective.--Botany is a "complex" of subject matter and requires a great variety of learning experiences. These may include the handling of a plant specimen, watching time lapse film, viewing photographs, reading from textbooks, Scientific American articles, listening to a discussion by the senior instructor, visiting with colleagues, etc. It is logical then that no single vehicle such as lecturing or a text book can achieve the full spectrum of objectives for this complex subject. The student's experiences should not be confined to any particular vehicle such as 8mm film, audio tape, text book, or any other of the great variety of communication devices which are now available to us. In cases where the development of a procedural skill is necessary, there is no substitute for the student doing this procedure himself. A properly structured course, therefore, would carefully define objectives and not try to mold objectives to fit a favorite medium (lecture, for example) but instead would use the medium best adapted to the nature of the objective. The audio-tutorial system permits this kind of student participation and enables one to bring to bear the correct medium commensurate with the objective.

6. The use of multi-media.--Individuals differ in their responsiveness to different kinds of communication devices. Some people learn well through reading, some can learn best by auditory communication, and others can learn best by literally handling specimens and doing of experimentation. While some of my colleagues think that

intellectual achievement is accomplished only through reading, it is my opinion that many poor readers are as intelligent as good readers and may literally become more knowledgeable than good readers if they are permitted exposure to subject matter through a communication vehicle more suitable to their receptiveness. The audio-tutorial system thus provides an opportunity for subject matter to be covered in a great variety of ways with the student exploiting that medium which communicates most directly and effectively for him.

7. Finally and most important of the learning activities and situations.--The significance of integrating learning events was brought abruptly to our attention by an accidental positioning of two experiments. Subject matter from experiment "A" was necessary for understanding the subject matter of experiment "B". For a number of semesters the students had had little or no difficulty of transferring information. In tracing the possible causes for the difficulty, it was discovered that during the preceding semesters experiment "A" and experiment "B" had been sitting in close proximity. Some new materials inserted in the course had forced the placing of experiment "B" on the opposite side of a demonstration table from experiment "A". Although this distance was a little more than three feet, the disassociation in space resulted in less students being able to transfer information from experiment "A" to experiment "B". It stands to reason then that if this disassociation in space by an even greater distance, still fewer students will be able to make the transfer of information.

One can extrapolate further and assume that if the dis-association is not only in space but in time as well, still less students will be able to transfer the information. While the proximity of positions of materials is not a very intellectual challenge to a teacher, this experience has served to emphasize to us that many of the students' problems are not caused by the difficulty of subject matter, but rather by these relatively simple factors. It stands to reason that if learning events are to be complementary and to have some relationship, they should be brought into close proximity and properly sequenced. The conventional structuring of a lecture, recitation and laboratory does not take this into consideration, but rather may expose a student on Monday to a lecture concerning a given subject, perhaps on Wednesday the student does experiments related to that subject, on Friday a recitation will involve the student in some exposure to the subject and then on Sunday night, late, the student may read on this subject from his text. The audio-tutorial system permits the student to bring all of these learning experiences into an integrated sequence so that each learning event may enhance or complement the adjacent ones and thus result in a synergistic effect. One might compare this analogously to an orchestra. Many musical instruments making sounds in a random fashion, result in noise or cacophony; however, these same sounds, if given timing and placed in an appropriate sequence or relationship one to another form a melody. I am suggesting that there is a melody of learning and that teaching is, indeed,

an art. It is the art of sequencing learning events into a meaningful experience for students.

Education is a science so that one must define the problem first and then go about logically developing a procedure which permits a student to engage in those activities which result in learning. It may require a total restructuring of courses and reorganization of approaches. Teaching is an art but the artistry comes not through the use of the teacher as a communication device but rather in his skill in determining objectives and developing the materials and sequences which will enable the students to achieve those objectives in the most efficient and effective manner. Many of us find this approach to education a little difficult. Teachers and educators are the most tradition-bound group of individuals I know. This happened in a logical evolutionary sequence, the explanation of which is relatively simple. In the days of Aristotle, the source of information was the scholar and he was the communication vehicle. It was logical that contact between the student and the educator was through lecturing. It is amazing that many of us still teach in this fashion feeling that our contribution is to expose to the student our knowledge of the subject matter, and many people who want to become teachers do so merely because the lecture is an ego-inflating device. We find it an exhilarating experience to stand before 500 people and to mystify them with our great knowledge of a given subject. In this age there are many communication devices more effective than the human being and ego-inflation of scholars is not a worthy objective for an educational system. We lost sight of the basic purpose of education a long time ago. When the situation was such that there was one teacher and one student, the teacher focused on the individual needs of that particular student, but when the teacher had two students, the focus was changed then to the needs of the teacher and the two students must then assemble at the convenience of the teacher. When the situation expanded to involve so many students that two

teachers were necessary, one teacher then became senior and a new group of individuals with individual problems was evolved, the administration. It is logical that for administration one would select the most aggressive and most skillful individual at problem solving. It is logical also that such an individual would solve the problems which were close at hand. During the years divergent evolution has occurred to produce a community of individuals who are concerned with problems of constructing buildings, obtaining funds, etc. and learning problems are given lower priority. With our administrators preoccupied with these problems, only lip service is given to such mundane things as the proximity of experiment "A" and experiment "B". Such small insignificant items are cast aside in favor of the more challenging and interesting activities associated with the vast numbers of students and big time education. I would like to cite just one example in support of my position. A certain university begins its semester with the first classes meeting at 11:30 A.M. on Wednesday. I challenge educators at that institution and at any other institution to show me a course for which good pedagogy dictates 11:30 on Wednesday as the appropriate time to begin the semester. I know of many courses, multiple section courses, for which this timing clearly is a disadvantage. Multiple sectioned courses which meet on Monday, Wednesday, and Friday will have some sections which will have been exposed on Wednesday afternoon, Friday afternoon and other sections which will have been exposed only on Friday so that the subsequent week's work will be totally out of synchrony. As a result, both instructors and students recognize the impossibility and impracticably of this situation so that students do not show up on Wednesday afternoon and if they did they would find a sign on the door saying "No class today", For all practical purposes, it is impossible to start course work until Monday morning of the subsequent week.

Now I ask you if good pedagogy does not dictate that classes begin at 11:30 on Wednesday what criteron then is used to establish the starting time? The answer is simply that this is an administrative convenience and the administrative convenience is taking precedence over sound pedagogical procedure. This is merely one example and if time permitted I could cite you many more.

One more thought. It was suggested to me that if one wishes to attract outstanding faculty to a University today, it is necessary to provide ideal teaching conditions. I should like to analyze this statement for you. What is meant by outstanding faculty? Outstanding faculty on most campuses are Nobel prize winners or those which have demonstrated competence in research activities. Secondly, what is meant by ideal teaching conditions? The answer is, few hours in the classroom and highly selected students who will learn in spite of the instructor. It is a truth that we have come to the point where instructors consider it a promotion when they are given the best students in the university or high school. I am suggesting to you that this is not a professional attitude. What would you think of a doctor who wished to take only those cases which could be cured by merely dispensing aspirin? Most of us would say that this is non-professional, and we would not want a doctor of this kind. We want a doctor who would like to concern himself with the hard-to-get-well cases and those cases which are challenging. If this be true, and teaching is a profession, a professional attitude would demand that we too would find the hard-to-get-well cases most challenging. Humbling as it may be, self-examination may be in order for us to determine whether we really and truly fulfill our role in the educational process. Are we succumbing to the ego-inflating exercises which display our great knowledge of the subject matter, or are we willing to accept that it is our responsibility to provide the facilities, provide the guidance and direction, and provide motivation to help students learn. Let us be honest with ourselves and true to our commitment.

Thank you very much.

Auto-tutorial and Mobile-tutorial Laboratory Techniques in Nursing Education

Crystal M. Lange
Delta College

In the summer of 1964 the Delta nursing faculty attended a workshop at Purdue University to prepare for the Associate Degree Program. At that time they had an opportunity to visit Dr. Postlethwait's botany laboratory: this experience served as an impetus to apply the same principles in the teaching of nursing techniques.[1] It was decided as a group to utilize the facilities available to us at Delta College; namely, the language laboratory and excellent tape recording facilities.

We had usually presented a unit, Mathematics for Nursing, as part of Fundamentals of Nursing. We decided to try a preliminary application of the auto-tutorial techniques, utilizing the mathematics unit of study. For the purposes of our study the group of 31 students was randomly divided into two groups. The control group met for 10 hours of the traditional classroom experience, constituting primarily lecture and problem-solving. The experimental group of 15 students met as a group with the instructor for approximately 5-15 minutes each week. The balance of the learning experience was provided in the language laboratory, made up of five lessons averaging 30 minutes each. Students had the opportunity to repeat any lesson at any time the student desired. The instructor was available for consultation during a prescribed period of time. In the experimental group the objectives for each lesson were listed, the equipment needed for the lesson, and a worksheet were provided. For example, the objectives for lesson one included:

(1) to measure accurately a cubic centimeter, or milliliter

(2) to identify the number of cubic centimeters in a teaspoon, dram, ounce

(3) to read and write the symbols for dram and ounce

(4) to identify the equivalents between the household, apothecary, and metric systems

For lesson one the equipment with which the student worked included: a medicine glass, teaspoon, tablespoon, dropper, syringes of varying sizes, container of water, and worksheets. The student was given basic information by means of an audio tape. With specific instructions he performed tasks such as: he measured centimeters and teaspoons and compared the different measurement using the specified equipment. The student practiced writing the symbols with an example and had an opportunity to compare the various measurement systems, both by doing and by means of a printed chart. Following the lesson or the auto-tutorial laboratory experience, the student had additional problems to solve individually (homework). When the student was ready, and during a prescribed time period, he presented himself for a quiz covering the materials for a lesson. Each of the lessons followed in sequence and built upon the previous experiences.

The students' reactions to the auto-tutorial laboratory presentation varied as evidenced in their responses to a questionnaire. Fifty per cent of the experimental group classified their learning experience as interesting, 20 per cent classified their experience as stimulating, 13 per cent classified the experience as exciting, and 13 percent as satisfactory. One student did not find any of the responses provided to be acceptable and indicated that the learning experiences were "helpful and complete." All 15 of the students, or 100 per cent, indicated that the quality of the auto-tutorial learning experience was an improvement as compared with other classroom learning. Eighty-six per cent of the students strongly urged the use of the auto-tutorial methods based on their experience in the laboratory and considering some recommended modifications. One of the students was undecided, and one student indicated that it would be preferred to

have both the auto-tutorial and the classroom experience, or a combination of both. (The total intent includes such a plan.) In comparing the method of presentation in the auto-tutorial laboratory to their previous classroom learning, 33 1/3 per cent of the experimental group classified the presentation as superior; 66 2/3 per cent classified the presentation as satisfactory.

The length of time for group discussion was brief; namely, 5-15 minutes. Sixty per cent of the students evaluated this time as satisfactory. Forty per cent considered it to be too short. Both the experimental and the control group were given the same final examination. The control group of 16 students had 9 students passing with a score of 70 per cent or better, constituting 56 per cent of the control group. Seven students failed with a score of less than 70 per cent, constituting 44 per cent failures. In the experimental group of 15 students, eleven students, or 73 per cent, passed with a score of 70 per cent or better. Four students failed with a score of less than 70 per cent, constituting 27 per cent.

Achievement on Final Exam

N=16 Control Group	N=15 Experimental Group
Passed 56%	73%
Failed 44%	27%

The group was not sufficiently large to produce valid comparisons. At the same time, the faculty considered the difference to be sufficiently significant to warrant further work with these techniques. With this encouragement production of 8mm films was begun demonstrating nursing techniques and complex situations which are not ordinarily study material in the traditional classroom. For example, the camera was taken to the homes of children in various age groups to photograph the behavior and activities of the children in home environment, both with their parents and their siblings. The 8mm films have been used in preliminary fashion with faculty description and discussion accompanying the films. In the projected

work with these materials the 8mm films will be used with audio tapes, transparencies, written verbal descriptions projected on a screen (comparable to those used in reading improvement laboratories), and specific equipment involved in the technique. For example, a film shows how to change a surgical dressing in a step-by-step fashion with an actual patient and the equipment ordinarily used for the procedure. The audio tape describes the procedure in step-by-step fashion accompanying the film. The student has an added advantage in that he may stop the film and/or the audio tape at any point for closer study. The student may review the learning experience as many times as he desires. Following the visual and audio experience, the student will then do the dressing. The word directions in front of him on a screen are controlled by him as to the speed of progression. He handles the equipment as often as he needs to in order to learn the technique. The auto-tutorial laboratory utilizes as many stimulae as possible to enforce the learning. The instructor will be available to assist the student at any stage and to evaluate the student.

By utilizing the auto-tutorial materials developed, the following objectives will be achieved to some degree:

1. Release the instructor for the individual student teaching needed in areas of patient communication and adaptions of techniques in specific situations.
2. Utilize faculty fully in teaching greater numbers of students without loss of instructional quality.
3. Permit the student to proceed at his individual speed to develop the necessary competencies in the nursing major.
4. Facilitate the use of the materials developed on a local, regional, and/or national basis in institutions conducting nursing education programs.

Using the multi-sensory approach which has not been extensively attempted in nursing education to date, will allow one nursing instructor to teach unlimited numbers of students without loss in quality of instruction. Further, students are able to learn selected materials at their own rate.

The student will request an oral or written examination and/or will demonstrate a skill when he feels secure in his knowledge before a designated time interval has elapsed. This has several positive aspects; namely, (1) helps the student maintain motivation, (2) helps the student gain satisfaction in mastering techniques needed in nursing, (3) reduces the frustration encountered by either the very slow or rapid learner, (4) allows the instructor more flexibility in utilizing time and (5) maintains the quality of instruction, while increasing the number of students.

The mobile tutorial unit will be in the instructor's possession in the hospital laboratory whenever he has a group of students caring for patients. As the student or faculty determines the need for reviewing a nursing technique under study or practice (for example, the student is going to change a dressing for a patient today), the student secures the materials; namely, the single concept film and accompanying explanations, and reviews these immediately prior to performing a specific procedure or technique. The student is able to reinforce his learning, utilizing these materials at any time. For example, an advanced student may not have had an opportunity to do a specific technique recently. The student can quickly review, reinforce, and recall his previous learning by utilizing the materials in the mobile-tutorial unit. At the same time, when the instructor observes that a student is deficient in a specific technique, the instructor is able to refer the student to a specific procedure; for example, putting on sterile gloves. The instructor will spend less time with students in reviewing techniques and procedures. We expect to develop materials covering the entire spectrum of

nursing techniques taught in a basic nursing curriculum. We forsee taping selected situations in nursing which will better prepare the student for his role in interpersonal relations in nursing care.

The auto-tutorial laboratory is to be located in the main building of the Delta Campus. The necessary renovations will occur in a classroom which will be readily available to students during regular scheduled class hours. The auto-tutorial laboratory is to be equipped with 20 booths, each containing the following equipment: individual lights, 8mm film cartridge projector, tape playback with earphones, nursing equipment as indicated by the specific technique under study; such as, syringes, vials, dressing trays, etc. A patient unit with larger equipment is accessible to students as well. The ATL will be open daily with an instructor available as a resource person.

The rationale is that the ATL will utilize the multi-sensory stimuli to bring the clinical situation and/or patient-nurse interaction situation to the student where he can objectively study and gain skill in a nursing technique. The lesson can be repeated several times or until the student feels reasonably sure of being able to perform the procedure in a testing situation, in the hospital laboratory or agency setting. Each student is exposed to the same learning experience and basic nursing technique, thus eliminating many of the individual faculty differences in the teaching of nursing techniques. In other words, the faculty must agree on the technique to be taught and all faculty members must therefore follow this technique in teaching students and then evaluate students in the clinical situation. (The basic technique does not eliminate individual student adaptations, rather it serves as an initial or suggested guide.) The evaluation of the student's performance will be the ultimate measure of the efficiency of these techniques. Check lists outlining the critical elements in nursing techniques to be evaluated are being designed by the Delta faculty. These check lists will be used to determine

the level of student learning and/or performance in the hospital or agency laboratory.

Items of equipment needed to convert a classroom to an auto-tutorial laboratory and approximate cost:

	Each	Total
20 tapes, playbacks	$180	$3,600
7 film strip cabinets	400	2,800
7 audio tape cabinets	150	1,050
20 tables, 42x24x30 and wall construction		975
30 8mm technicolor projectors, 20 for lab and 10 for mobile		6,135
	Total	$14,560

The cost of equipping a similar room in another institution would be comparable or approximately the same as listed.

To date, in addition to the materials developed for the mathematics course described earlier, the faculty has prepared approximately twenty-five 8mm films. We have learned a great deal by this experience of the things not to do as well as the things to do. A number of the films will be redone because they are not the quality that we had hoped to have, and some of them do not do the job we had expected. We have prepared films on handwashing technique, putting on sterile gloves, dressing change, catherization, isolation technique, tracheostomy care with an actual patient in a hospital, and colostomy care wherein a patient in a hospital demonstrates care of her own colostomy. A number of films in the area of child development ranging from newborn wherein we filmed a child less than 12 hours old to elicit its specific responses and bathing of an infant in the newborn nursery. Children at specific ages; namely, 4 weeks old child, 8 weeks, 12 weeks, 3 months, 6 months old,9 months old, 12 months old, 2 year old, etc.,

have also been filmed for classroom study.

The first film example shows isolation technique and represents the kind of thing one could do which involves multiple or complex equipment preparation. We will show this and have an opportunity to stop at various points for discussion. The second film represents the kind of thing one could do with children in their home setting.

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[1]Postlethwait, S.N., Novak, J., and Murray, H., An Integrated Experience Approach to Learning. Minneapolis, Minnesota: Burgess Publishing Company, 1964.

Project Grant Application for Improvement in Nurse Training

18. Project Plan

A. Objectives

By utilizing the audio-visual materials developed and through the use of the auto-tutorial laboratory and mobile-tutorial units, the following objectives will be achieved:

1. Release the instructor for the individual student teaching needed in areas of patient communication and adaptations of techniques in specific situations.

2. Utilize faculty fully in teaching greater numbers of students, without loss of instructional quality.

3. Permit the student to proceed at his individual speed to develop the necessary competencies in the nursing major.

4. Facilitate the use of the materials developed on a local, regional, and/or national basis in institutions conducting nursing education programs.

B. Project Need and Background

Nursing educators urgently need to teach greater numbers of students with approximately the same numbers of educational staff.

Surgeon General Luther L. Terry, in releasing the report, Toward Quality in Nursing, Needs and Goals, [1] said, "The consultant group's report gives us the information about nursing problems which is essential to help fill the gap in our knowledge of total health manpower needs. It more than confirms our earlier beliefs about the magnitude and seriousness of the problems in nursing which stand in the way of giving good care to the people of the nation."

Added to the shortage of properly-trained personnel is the dearth of qualified nursing educators and supervisory personnel. Further compounding this problem is the need to educate patients and co-workers on the nursing care team.

The increasing student population entering the nursing curriculum represents a diversity of experiences and potentials, thus, various approaches must be utilized to properly train these people in meeting the needs of nursing services to society.

S.N. Postlethwait, J. Novak, and H. Murray in the monograph, An Integrated Experience Approach to Learning, [2] have found this approach to be an effective method of instruction for a large group of students in botany.

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[1] Toward Quality in Nursing, Needs and Goals, Department of Health, Education and Welfare, Public Health Service, U.S. Government Printing Office, Washington, D. C., February 1963.

[2] An Integrated Approach to Learning, S.N. Postlethwait, J. Novak, H. Murray, Burgess Publishing Company, Minneapolis, Minnesota, 1964.

Using the multi-sensory approach, which has not been attempted in nursing education to date, will allow one nursing instructor to teach fifteen or more students without the loss of quality of instruction. Further, students are able to learn selected materials at their own rate, thus enabling faculty to be more flexible in the use of his time in assisting the more able student to gain greater knowledge and the less gifted student to become more proficient in the specific area of study.

Method of Procedure

I. Definitions of Terms:

1. General Assembly Session (GAS): The General Assembly Session is held weekly by the senior instructor (100 or more students) to present material of a general or comprehensive nature, e.g., the description of health and disease.

2. Small Assembly Session (SAS): The Small Assembly Session meets weekly with the senior instructor or a resource person for discussion, clarification, testing, etc. This group will usually be comprised of 25 students or less.

3. Independent Study Session (ISS): The time spent independently by the student in the auto-tutorial laboratory studying the specific material under discussion (example: the administration of drugs, aseptic technique, and/or handwashing).

4. Auto-Tutorial Laboratory (ATL): The college nursing laboratory facility that includes 8mm film cartridges, 8mm film projector, tape playbacks, nursing equipment, earphones, and short-taped lectures for the learning experience of the individual student.

5. Mobile-Tutorial Unit (MTU): The equipment assigned to each faculty member for use in the hospital clinical laboratory, or other facility, consists of 8mm film projector and 8mm film cartridges. The student can use this equipment prior to performing a given procedure (3-4 minutes), such as, changing a dressing or administering a medication, for reinforcement of learning.

II. Description:

The demonstration project's principal investigator, Mrs. Crystal Lange, will develop 8mm films of various nursing techniques suggested by the participating faculty, and short-taped lectures of pertinent data for the procedure under study. This material will be used by the student in the ATL during an independent study session. An instructor will be available in the ATL as a resource person to the student.

The gifted student may delete or by-pass material he already understands and continue his quest for further knowledge in nursing techniques. The less gifted student may review the material several times or until he feels confident in having gained mastery of the material.

The student will request an oral or written examination and/or will demonstrate a skill when he feels secure in his knowledge before a designated time interval has elapsed. This has several positive aspects, e.g., (a) helps the student maintain motivation; (b) helps the student gain satisfaction in mastering techniques needed in nursing; (c) reduces the frustration encountered by either the slow or rapid learner; (d) allows the instructor more flexibility in utilizing his time; and finally, (e) maintains the quality of instruction, while increasing the number of students under a faculty member's supervision.

The mobile-tutorial unit will be in the instructor's possession in the hospital laboratory whenever he has a group of students in a practice session. As the student, or faculty determines the need for reviewing a nursing technique under study or practice (administration of an injection by the intramuscular route), the student secures the materials and reviews them. Therefore, he reinforces his learning when he demonstrates lack of proficiency.

The materials developed will cover the entire spectrum of nursing techniques taught in the basic nursing curriculum. We can forsee taping selected situations in nursing which will better prepare the student for his role in interpersonal relations in nursing care.

The developed materials will be made available to nursing faculty in the area and throughout the country for utilization in the basic nursing program. The end result will be better utilization of nursing faculty in the instruction of larger numbers of students, thereby, assisting in meeting one of the major needs to provide nursing care to the people of the nation.

III. Basis of Research:

Postlethwait, Novak, and Murray, at Purdue University, have successfully used the integrated experience approach to learning in the freshman botany course. This approach provides the student with maximum freedom in the use of independent study sessions. For example, the more able student may delete background information he already possesses, while the less gifted student, by repeatedly reviewing the material under study, paces himself accordingly and becomes more proficient in the use of nursing techniques. The student uses the laboratory at his convenience and works until he has mastered the materials being studied. This approach is far less frustrating to the student because he is able to set his own pace and learning is reinforced because of self-motivation.

The research briefly described above suggests the project to be demonstrated. The teaching of nursing techniques must be flexible and by the use of multi-faceted approaches, greater numbers of students can be prepared without loss of quality of instruction. The demonstration will also support the value of auto-tutorial methods in providing the student with the opportunity to adjust his study time in accordance with his background, interests, and capacities. Teacher-student contact is maintained at an even more personal level than by usual methods.

Postlethwait states that teachers must "explore more and better ways of providing students with opportunities to learn." [1] Therefore, it is incumbent upon nursing educators to utilize all available teaching resources in order to meet the growing demands for nursing care by society.

IV. Setting:

Delta College serves the tri-county area of Bay, Midland, and Saginaw with a combined population of 350,000. The area is a combination of farming and diversified industry. Among the industries represented in the area are: Dow Chemical, Dow Corning, General Motors, and Wickes Corporation. Thus, many resource people are available for consultation in technical areas.

The auto-tutorial laboratory will be located in the main building of Delta College. The necessary renovation will occur in a classroom which will be readily available to students during regularly scheduled class hours.

The ATL will have twenty booths constructed, each containing the following equipment: individual lights, 8mm film cartridge projector, tape playback with earphones, nursing equipment, as indicated by the specific technique under study, syringes, sponges, vials, and a cabinet containing the various nursing technique films (hand washing, changing a colostomy dressing, administration technique for injections). The ATL will be open daily with an instructor available as a resource person.

The rationale for the above briefly described project is that the ATL will be utilized (by the use of 8mm films and short-taped lectures), to bring the clinical situation and/or patient-nurse interaction situation to the student where he can objectively study and gain skill in a nursing technique. The lesson can be repeated several times or until the student feels reasonably sure of being able to perform the procedure in a testing situation, or in the hospital laboratory or agency setting. Each student is exposed to the same learning experience and basic nursing technique, thus, eliminating many of the individual faculty differences in the teaching of nursing techniques.

In like manner, the MTU, can be carried to any health agency where the student is having a learning experience. This equipment enables the student to review a particular procedure, with the instructor available as a resource person, prior to the actual experience. (Example: a dressing change.) The multi-faceted approach reinforces student learning of basic nursing techniques and/or patient-nurse interaction and frees the instructor from time-consuming review sessions.

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[1] An Integrated Experience Approach to Learning, S.N. Postlethwait, J. Novak, H. Murray, Burgess Publishing Company, Minneapolis, Minn. 1964.

V. Population:

The students participating in the project range in age from 17 to 50 years with backgrounds varying from the general equivalency diploma to high school and/or college. Therefore, when they enter the nursing program, they bring different backgrounds and depth of experiences to the educational setting. They are male and female of any race, color, or creed and are enrolled in the Associate Degree Nursing Program; at Delta, that is 4½ semesters in length.

The nursing faculty participating in the project are predominantly prepared in the several specialty areas of nursing (Medical-Surgical Nursing, Maternal-Child Health Nursing, and Psychiatric Nursing). They are in agreement as to the feasibility and tremendous impact on nursing education the proposed project will engender. Further, they are very enthusiastic and committed to the activity.

VI. Materials Development:

Mrs. Crystal Lange, principal investigator, will develop 16mm color films of the selected nursing techniques (to be reduced to 8mm single concept cartridges) or learning units that may be five to twenty minutes or more in length. Short-taped lectures giving the specific information and/or instructions will also be prepared. The films and lectures will be produced in the television studio, in the hospital setting when appropriate, or any other specific setting (e.g., private home with children interacting for the growth and development series).

Transparencies, charts, and student guides, as indicated will be produced by the various nursing faculty members who are particularly knowledgeable in a nursing discipline (Medical-Surgical Nursing).

Technical assistance will be given by the Television Department of Delta College.

VII. Evaluation:

Check lists outlining the critical elements in nursing techniques to be evaluated will be designed by the faculty. These check lists will be used to determine the level of student learning and/or performance in the hospital or agency laboratory.

VIII. Dissemination of Information:

The results will be published and made available to nursing faculty in the country. The films and short-taped lectures will also be available to interested faculty on either a rental and/or purchase basis. Therefore, it is foreseen that the results of the project will be, with individual institutional modifications, useful to faculty in nursing for the teaching of nursing techniques.

Exhibit I

Time Schedule:

NOTE: The following is a tentative time schedule designed by the Project Director and the Principal Investigator. The schedule has been developed as a possible sequence of steps based on our present knowledge and experience. Once the project is underway, there may be modifications of the schedule contingent upon the experience and judgment of the investigator. It is important to remember that all faculty involved in the project are free from college teaching commitments from April to September, thus lending greater flexibility to the time schedule.

1. September 1966-September 1967:
   Preliminary workshop*; renovation of classroom; purchase of equipment; plan for and prepare materials (films, taped lectures, study guides, transparencies, and charts, primarily for the first nursing course, Fundamentals of Nursing).

2. September 1967-December 1967:
   Use of materials in the first nursing course with ongoing evaluation; development of autotutorial materials for the next nursing course Nursing of Mothers, Infants, and Children. Prepare interim report for submission to USPHS.

3. January 1968-April 1968:
   Use of materials in the second nursing course, Nursing of Mothers, Infants, and Children, with ongoing evaluation. Begin development of auto-tutorial materials for the next nursing course, Physical and Mental Illness, Nursing 211.

4. April 1968-September 1968:
   Continue preparation of materials for the last nursing course, Physical and Mental Illness, Nursing 212. Revise and update materials for Fundamentals of Nursing course. Prepare interim report for submission to USPHS.

5. September 1968-December 1968:
   Use of materials for the third nursing course, Physical and Mental Illness, Nursing 211. Revise and update materials for Nursing of Mothers, Infants, and Children, Nursing 112; and Physical and Mental Illness, Nursing 212.

6. December 1968-June 1969:
   End of project evaluation; preparation and submission of project report to USPHA; plan and implement demonstration workshop (one or more as indicated). Arrange for multiple duplication of materials for sale on demand basis.

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*The preliminary workshop will include Delta College faculty; selected faculty and/or educators from various areas of the state and country to assist in the overall planning of the materials to be developed; and consultation services will be arranged.

Items of Equipment Costing Less than $500

1 Zoom Lens (manual)

1 8mm Camera, Tripod and Light

20 sets--earphones

2 Overhead Projectors

2 Storage Cabinets

1 Hospital Bed

1 Sima Training Doll

1 Bedside Stand

20 Chairs for ATL

20 Light Fixtures (one in each booth)

Water Outlet and Sinks

Outlets and Wiring for 20 Booths

Items of Equipment Costing More than $500

1	16mm Bolex Camera (silent)
1	16mm Aurican Camera (sound on film)
30	8mm Technicolor Projectors, 200 WA Model
20	Tape Playbacks
360	Projector Replacement Lamps
7	Film Storage Cabinets
7	Audio Tape Cabinets
20	Tables, 42" x 24" x 30" and Wall Construction
	Oxygen Equipment
1	Dictaphone Receiver and Transcriber

Supplies

50	Rolls 16mm Color Film (includes processing)
125	8mm Color Film (includes processing)
3000	Cartridges (single concept) 20 prints of each of 100 programs
1300	Audio tapes (5" reel, 600 ft. per reel) 1½ mil. mylar
1000	Transparencies, color and overlays
	Art supplies and materials
1000	Disposable Syringes
50	Disposable Dressing Trays
1000	Disposable Medicine Cups
25	Enema Trays
	Office Supplies (paper, envelopes, study guides, telephone, postage, folders, etc.)

All other Expenses

Statistical

Duplicating

Consultants

Pre-project Workshop

December 9, 1966

Miss Constance Holleran
Chief Nurse Consultant
Project Grant Section
Nurse Education and Training Branch
Division of Nursing
U.S. Public Health Service
800 North Quincy Street
Arlington, Virginia

Dear Miss Holleran:

This is to confirm our telephone conversation with you of December 9, 1966, regarding our need for a conference bringing together all persons involved in projects in the audio-visual areas. We feel that a conference of this type would achieve several goals. For example: coordinate activities of the various projects, avoid duplication of materials, save money and effort, and provide for maximum benefit to nursing education as a whole from the grants.

We would like a conference of this type to be held as soon as possible. Preferably, the week of January 23, 1967, or the week of February 13, 1967.

Virginia Chandliss
Project Coordinator
Deaconess Hospital School of Nursing
Evansville, Indiana

Patsy Burns
Project Assistant
University of Wisconsin - Milwaukee

Marie Piekarski
Coordinator of Associate Degree Education
in Nursing
University of Kentucky
Community College System

Crystal Lange
Project Principal Investigator
Delta College

Mrs. Crystal Lange
Project Director
Delta College
University Center
Michigan 48710

Dear Mrs. Lange:

Miss Holleran has informed me of her telephone conversation with you and the follow-up telegram she received on December 9 expressing the interest of several Improvement in Nurse Training project directors in having the Division of Nursing plan a conference at which all those involved in audio-visual projects might be brought together to share ideas and to promote better utilization of project manpower and funds.

The idea interests us very much and we agree that such a conference could be very helpful to nursing education.

At this time, we cannot set a definite date for the conference as there is a great deal of planning, with many people involved, which must take place. We realize the need to proceed rapidly and you will be hearing from us soon.

It would be helpful if you would send us some of the discussion points you would like to have included in the conference proposed.

We appreciate your interest and your suggestion.

Sincerely yours,

Jessie M. Scott
Chief
Division of Nursing

January 6, 1967

Miss Jessie M. Scott
Chief
Division of Nursing
Department of Health, Education,
and Welfare
Public Health Service
800 North Quincy Street
Arlington, Virginia 22203

Dear Miss Scott:

Thank you for your letter regarding a conference for those involved in audio-visual projects. A work conference would greatly improve the utilization of project manpower and funds.

It has been my experience that a great deal of human energy and creativity is required in the production of quality materials. From my limited contacts, it appears to me that there is considerable duplication of efforts going on at the present time. It would seem advisable to me, if at all possible, that a planned conference should make some progress in the following areas:

1. Provide nation-wide information at the person-to-person level as to the kinds of activities presently in progress.

2. Explore the immediate and long-range potential for the sharing of developed materials to the degree that efforts are not duplicated.

   For example, at our workshop Patricia Burns, of the University of Wisconsin, showed some slides on making an occupied bed. The quality of the slides is excellent. I see no real point in duplicating this effort since the activity is common to nursing and would be just as effective for our students' learning. At the same time, we have some materials in specific areas such as dressing change which could easily be used by other nursing education programs. It seems exceedingly wasteful that each of us should spend time, money, and energy in repetitive activities if it can be avoided.

3. Demonstrate materials developed such as slides, films, transparences, photographs, study guides, etc. with accompanying explanations at what ever point in development they may be at the time. If we could coordinate activities on a national level, the quality of nursing education could easily be advanced ten or more years in a three year span. The potential here is tremendous.

4. Consider the appointment of a qualified nurse-educator to function as a full time national coordinator of these projects with the objective of avoiding duplication of activities whenever feasible. This person could also function as a resource of information and as a consultant. Is there such a person or position at present?

5. Suggest ways and means or develop guidlines for educational institutions to follow in the sharing of audio-visual materials. There seems to be a high wall of vague - possessiveness which is difficult to identify or work with at the present time. Perhaps this area should be considered by a separate group at a different conference.

Those of us who discussed this proposal are convinced that it is essential to the best utilization of manpower and funds. If I can be of any further assistance in any aspect of planning, or implementing such a conference, please let me know. I will look forward to hearing from you very soon.

Sincerely yours,

Crystal M. Lange
Project Principal Investigator

CML:bep

March 2, 1967

Mrs. Crystal M. Lange
Project Principal Investigator
Delta College
University Center, Michigan 48710

Dear Mrs. Lange:

I have your letter of February 13 regarding a conference for directors of projects having to do with audio-visual techniques.

I am sure you know by now that we are moving along with plans to hold such a conference. If you have not already received your invitation, you will receive it shortly.

We appreciate very much your deep interest and look forward to your continuing assistance.

Sincerely yours,

Jessie M. Scott
Director
Division of Nursing

Resources Identified

Dr. Inez Hinsbark
Dean
College of Nursing
South State University

Dr. Hinsbark has developed materials for the teaching of operating room nursing. A copy of the dissertation can be secured from University Microfilm, Ann Arbor, Michigan.

Becker, Mary E. and Mihelcic, Marilyn: "Programming A Motor Skill," The Journal of Nursing Education, August, 1966, p. 25-30.

Mrs. Kathleen Mikan
Michigan State University
School of Nursing
Lansing, Michigan

Mrs. Mikan has developed materials for the teaching of temperature, pulse, and respiration. The materials include audio-tape, film, slides, equipment, workbook, and specific objectives for the unit.

Mrs. Patricia Burns
Project Assistant
University of Wisconsin
Milwaukee, Wisconsin

Mrs. Burns shared a sequence of slides developed to teach bed making. The slides are accompanied by a synchronized tape recording. Additional materials have been, and are being developed for teaching fundamentals of nursing and medical-surgical nursing.

Trainex Corporation
3167-B Brookhurst
P.O. Box 116
Garden Grove, California 92640

Film strips with recordings are available at a cost of $45.00 per program. Each program consists of approximately 100 frames. Slides are also being prepared; the cost has not been determined. The subject areas covered include: (1) bathing, (2) bed-making, (3) T.P.R., (4) blood pressure, (5) enema, (6) admission and discharge, (7) feeding the patient, (8) medical asepsis, (9) lifting and moving, and (10) urinary care.

Film Associates
Educational Films
11559 Santa Monica Boulevard
Los Angeles, California 90025

Eleven single concept films with the following titles:

"Pre and Post Injection Techniques"
"Technique of Intravenous Injection"
"Technique of Intramuscular Injection"
"Technique of Subcutaneous Injection"
"Technique of Intradermal Injection"
"Technique of Gastrostomy Feeding"
"Technique of Female Catheterization"
"Mouth-to-Mouth Resuscitation"
"External Cardiac Massage"
"Mouth-to-Nose Resuscitation"